ABSTRACT

A wireless network of multiple base stations, each communicating with multiple remote terminals, exhibiting simpler design and enhanced inter-user and inter-base interference rejection. The downlink from a base to the multiple remote terminals employs a combination of time division multiplexing (TDM) and time division multiple access (TDMA) to multiplex signals carrying data to the remote terminals, and spreads the multiplexed signal with a pseudo-random noise (PN) sequence. The uplink from each remote terminal to the respective base uses orthogonal code division multiple access (O-CDMA) coding to multiplex a variable number of channels for each remote terminal. Short O-code sequences are derived based on pseudo-random maximal length sequences and quadratic residue sequences to introduce sufficient randomness into the multiple access coding to reject inter-base interference without the use of PN signal spectrum spreading.